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Evaluation of implementation of compounds unit at 9th grade in the new chemistry curriculum

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Abstract

The aim of this study is to evaluate the implementation of compound unit by chemistry teachers at 9th grade in the chemistry curriculum; which was started to be implemented in the present academic year (2008-2009). The study was carried out with 14 chemistry teachers in different schools, who are active in teaching secondary education 9th grade chemistry, in the autumn semester. Data in the investigation was obtained by implementing a semi-structured interview to 5 chemistry teachers and by implementing the evaluation scale to 14 chemistry teachers. The data were analyzed and compared according to the factors as the faculty each of the teachers graduated, type of school they are working and their year of experience. Besides, similar statements of the teachers were given in one sentence summarizing the views while different statements were quoted without adding any comments during the analysis of the interviews. Some recommendations were then presented on the basis of the findings of the study.

Keywords: Secondary education; chemistry curriculum; chemistry education; teacher education; compounds.

1. Introduction

There is no question that the physical sciences contribute very much to the technological development process to all nations around the world. Therefore, great effort has been put to raise the quality of education in learning physical sciences. The effort mostly focused on making better curriculums, providing schools with means to effective implementation of the curriculum, and developing reasonable and appropriate instructional methods. Science and technology, which have been developed quickly, affect each field of education and especially necessitate fundamental transformations for educational approaches at the present day. Constructivist approach becomes a significant philosophy in the present information and technology age with the interpretation that

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traditional education approaches are insufficient for effective teaching and learning. The focus in this approach is to improve mental skills of students and constructing information by student-centralized perception instead of changing the behavior of student by teacher-centralized perception. The 9th grade chemistry curriculum, aiming to educate individuals who are aware of chemical concepts and principles affecting their life and also conscious of individual and social responsibilities within Turkish National Education's main aims, was enforced in 2007. Turkish Education System was then reconfigured with the effect of the curriculum reform.

Curriculum development efforts must of course be continuous for the success of the configuration. When curriculum development studies in Turkey within a historical process are analyzed, they are seen generally not to have been evaluated comprehensively. When the curricula were evaluated in the studies, deficiencies were not tried to be removed or incorrect solutions were implemented as precautions. Transistorizes of the curriculum development studies in the literature is shown as the most important reason underlying lacking or incorrect applications and failures appearing with the curriculum development practices in Turkey. It is necessary that the curriculum must be continuously, comprehensively and impartially evaluated for the purpose of determining whether there are inadequate, erroneous or lame elements in order to make required corrections in application process of the curriculum.

Basic application sources for evaluation of the curriculum during practice period are teachers who put curriculum into practice with the previously mentioned aim. On the basis of these reasons; the aim in this study is that chemistry teachers would evaluate practice of compounds unit in secondary education 9th grade chemistry curriculum that was started to be implemented in 2008-2009 academic year.

1. Methodology

The study was carried out with 14 chemistry teachers, who teach secondary education 9th grade chemistry lessons in different schools, in autumn semester of academic year of 2008-2009. A case study method is used in this study that enables deep investigation of a subject chosen by using qualitative and quantitative techniques together. Data in the investigation was obtained by implementing a semi-structured interview to 5 chemistry teachers and evaluation scale to 14 chemistry teachers. Licert- kind scale, developed for a study in literature (Gömleksiz and Bulut, 2007) , was used to gather data in this study. The data was analyzed and compared according to some factors as the faculty teachers' graduated, type of school they are working and their year of experiences. Besides, similar statements of the teachers were given in one sentence summarizing the views while different statements were quoted without any adding comments during the analysis of interviews. Some recommendations were then presented on the basis of the findings of the study.

2. Findings

3.1. The Findings of the Gage

It is showed in Table 1 that the results of the variance analysis on chemistry teachers' ideas about the evaluation of the chemistry curriculum according to 'gender' and 'experience' variables are given comprehensively.

Table 1: Variance analysis results on chemistry teachers' ideas related to the evaluation of the chemistry curriculum according to 'gender' and 'experience' variables

Tests of Between-Subjects Effects

Dependent Variable: puan

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1,929[a]	4	,482	,846	,534
Intercept	75,702	1	75,702	132,707	,000
cinsiyet	,147	1	,147	,258	,625
deneyim	1,284	2	,642	1,126	,371
cinsiyet * deneyim	,053	1	,053	,093	,769
Error	4,564	8	,570		
Total	98,051	13			
Corrected Total	6,493	12			

a. R Squared = ,297 (Adjusted R Squared = -,054)

e's Test of Equality of Error Vari

Dependent Variable: puan

F	df1	df2	Sig.
6,181	4	8	,014

Tests the null hypothesis that the error var dependent variable is equal across groups.

a. Design: Intercept+cinsiyet+deneyim+cir

No meaningful differences were found both between teachers'' ideas about the evaluating of the curriculum and variables of 'gender' and 'experience' (F(1-8)=0,258, p>0.05(2-8) ; F(2-8))=1.126, p>0.05; F(1-8)=0,93, p>0.05). These findings showed that these two different variables do not have an important effect on teachers' ideas related to the evaluating chemistry curriculum.

3.2. The Findings of the Interview

Teachers' ideas are presented by combining their similar statements, also without submitting the interview questions, when the findings of the interview are presented as below :

1. The ideas of the teachers about the applicability of compounds' unit in the new chemistry curriculum
   A1: The teachers stated that number of concepts on the curriculum is too much and they are not systematic. Besides, they stated that they had to study the concepts superficially and use classical methods because of limited time.
2. The ideas of the teachers about how much the new curriculum can be able to provide the students with the consciousness of learning, research method and techniques.
   A2: The teachers stated that the experiment on the compounds' unit can not be realized because the time was limited (boiling time is 40 minutes for instance) and students were more orientated to memorize information instead of encouraging research because some sub-subjects (organic) on this unit included information to be memorized.
3. The ideas of the teachers about unit's acquisitions; how suitable they can be on the students' cognitive, affective, and psychomotor characteristics and their applicability in the present schools' resources:
   A3: The teachers stated that acquisitions are suitable only for students at high cognitive levels and applicable in the schools endowed with sufficient equipment.
4. The ideas of the teachers about effectiveness of the activities related to compounds' unit in the new curriculum in motivating students to engage in the course:
   A4. The teachers stated that they could not apply all activities because the time was limited. On the other hand, when the students attended classes prepared; and the teachers thought the subject supporting with the examples related to daily life, students' motivation increase.
5. The ideas of the teachers on the comparison between new and old chemistry curriculums according to applicability the compounds' unit:

A5. The teachers stated that new curriculum was more related to the daily life than old one and helped students to be active and to make learning more meaningful as they finding the knowledge by themselves. On the other hand, chemistry teachers stated that they had difficulties to achieve the aims of the curriculum for reasons such as the number of concepts was more than manageable, the time was limited, teachers did not have a guide book, and they were in the period of transition. They also stated that they would have to research in detail in order to efficiently implement the new curriculum and teachers considered this process as an extra burden.

3. Discussion and Conclusion

New Chemistry Curriculum , based on Constructivist Learning Model, aims to activate the students in lessons. It is frequently emphasized in curriculum that students should be active and they must learn by doing experiments and other learning activities by themselves (MEB, 2007). There are some questions regarding the success of the program based on teachers' belief that the lessons could not be studied with student-centered approaches because of insufficient time and density of concepts in contrast with the program's argument on the realization of student-centered approaches and methods. The statements of teachers regarding not having enough activities in student's book, they have some problems related to find or develop them, and especially some topics are not suitable to do student- centered activities resulted their necessity to use classical methods. This situation shows a great need for teacher's to have a guide book on to use the student's book. Although it is stated that line of acquisitions was prepared regarding both training and education simplicity and systematic line of chemistry in the new CIC for 9th class published in 2007 by MEB, the teachers' opposite thoughts are thought provoking.

Applicability of ionic compounds unit in curriculum of secondary education 9^{th} grade chemistry lesson is found to be low when data from the survey and interviews were analyzed.

4. Recommendations

Followings can be recommended on the basis of the conclusion of this study:

1. Time of chemistry lesson should be increased.
2. Density of concepts should be decreased.
3. Teacher's guide book and student's workbook that consist of alternative activities should be prepared.
4. The number of studies similar to this study should be increased so that works regarding to evaluation of the program should be continuous.
5. Re-evaluation of curriculum is recommended by taking conclusions of this study and similar studies into consideration.
6. In-service education trainings can be organized to provide the teachers the methods of developing different activities by professional people.
7. Seminars aiming to increase teachers' beliefs regarding the applicability of this program can be organized.

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